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 Jensen, Christian S
 Gao, Caixa
 Salchert, Klaus

<120> Method of Repressing Flowering in a Plant

<130> P12791PC

<140> PCT/EP03/02629

<141> 2003-03-10

<150> US 60/363,125

<151> 2002-03-11

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<170> PatentIn version 3.1

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<211> 173

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<213> Lolium perenne

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Val Leu Asp Pro Phe Asn Pro Cys Val Lys Met Val Ala Thr Tyr Asn 20 25 30

Ser Asn Lys Leu Val Phe Asn Gly His Glu Leu Tyr Pro Ser Ala Val 35 40 45

Val Ser Lys Pro Arg Val Glu Val Gln Gly Gly Asp Leu Arg Ser Leu
50 55 60

Phe Thr Leu Val Met Thr Asp Pro Asp Val Pro Gly Pro Ser Asp Pro 65 70 75 80

Tyr Leu Arg Glu His Leu His Trp Ile Val Ser Asn Ile Pro Gly Thr 85 90 95

Thr Asp Ala Ser Phe Gly Gly Glu Val Met Ser Tyr Glu Ser Pro Lys 100 105 110

Pro Asn Ile Gly Ile His Arg Phe Ile Phe Val Leu Phe Lys Gln Lys 115 120 125

Arg Arg Gln Thr Val Ser Val Pro Ser Phe Arg Asp His Phe Asn Thr 130 135 140

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Tyr Phe Asn Cys Gln Arg Glu Thr Ala Ala Arg Arg Arg 165 170

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<211> 177

<212> PRT

<213> Arabidopsis sp.

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Val Val Gly Asp Val Leu Asp Phe Phe Thr Pro Thr Thr Lys Met Asn 20 25 30

Val Ser Tyr Asn Lys Lys Gln Val Ser Asn Gly His Glu Leu Phe Pro $35 \hspace{1cm} 40 \hspace{1cm} 45$

Ser Ser Val Ser Ser Lys Pro Arg Val Glu Ile His Gly Gly Asp Leu 50 55 60

Arg Ser Phe Phe Thr Leu Val Met Ile Asp Pro Asp Val Pro Gly Pro 65 70 , 75 80

Ser Asp Pro Phe Leu Lys Glu His Leu His Trp Ile Val Thr Asn Ile 85 90 95

Pro Gly Thr Thr Asp Ala Thr Phe Gly Lys Glu Val Val Ser Tyr Glu
100 105 110

Leu Pro Arg Pro Ser Ile Gly Ile His Arg Phe Val Phe Val Leu Phe 115 120 125

Arg Gln Lys Gln Arg Arg Val Ile Phe Pro Asn Ile Pro Ser Arg Asp 130 135 140

His Phe Asn Thr Arg Lys Phe Ala Val Glu Tyr Asp Leu Gly Leu Pro 145 150 155 160

Val Ala Ala Val Phe Phe Asn Ala Gln Arg Glu Thr Ala Ala Arg Lys 165 170 175

Arg

<210> 5

<211> 178

<212> PRT

<213> Brassica napus

<400> 5

Met Glu Asn Met Gly Thr Arg Val Ile Glu Pro Leu Ile Val Gly Arg
1 10 15

Val Val Gly Asp Val Leu Asp Asn Phe Thr Pro Thr Ile Lys Met Asn 20 25 30

Val Ser Tyr Asn Lys Lys Gln Val Ser Asn Gly His Glu Leu Phe Pro 35 40 45

Leu Ala Val Ser Ser Lys Pro Arg Val Glu Ile His Asp Gly Asp Leu 50 55 60

Arg Ser Phe Phe Thr Leu Val Met Thr Asp Pro Asp Val Pro Asn Pro 65 70 75 80

Ser Asp Pro Phe Leu Lys Glu Arg Leu His Trp Leu Val Met Asn Ile

95----

Pro Gly Thr Thr Asp Ala Thr Phe Gly Lys Glu Val Val Ser Tyr Glu 100 105 110

Leu Pro Lys Pro Asn Ile Gly Ile His Arg Tyr Val Phe Val Leu Phe 115 120 125

Arg Gln Lys Gln Arg Arg Val Lys Phe Pro Ser Asn Ile Ile Ser Arg 130 135 140

Asp Gln Phe Asn Thr Arg Glu Phe Ala Ile Glu Asn Asp Leu Gly Leu 145 150 155 160

Pro Val Ala Ala Val Phe Phe Asn Ala Gln Arg Glu Thr Ala Ser Arg 165 170 175

Arg Arg

<210> 6

<211> 178

<212> PRT

<213> Brassica napus

<400> 6

Met Glu Asn Met Gly Thr Arg Val Ile Glu Pro Leu Ile Val Gly Arg 1 5 10 15

Val Val Gly Asp Val Leu Asp Asn Phe Ala Pro Thr Ile Lys Met Asn 20 25 30

Val Ser Tyr Asn Lys Lys Gln Val Ser Asn Gly His Glu Leu Phe Pro 35 40 45

Leu Ala Val Ser Ser Lys Pro Arg Val Glu Ile His Asp Gly Asp Leu 50 55 60

Arg Ser Phe Phe Thr Leu Val Met Thr Asp Pro Asp Val Pro Asn Pro 65 70 75 80

Ser Asp Pro Phe Leu Lys Glu Arg Leu His Trp Leu Val Met Asn Ile 85 90 95 Pro Gly Thr Thr Asp Ala Thr Phe Gly Lys Glu Val Val Ser Tyr Glu
100 105 110

Leu Pro Lys Pro Asn Ile Gly Ile His Arg Tyr Val Phe Val Leu Phe 115 120 125

Arg Gln Lys Gln Arg Arg Val Lys Phe Pro Ser Asn Ile Ile Ser Arg 130 135 140

Asp Gln Phe Asn Thr Arg Glu Phe Ala Ile Glu Asn Asp Leu Gly Leu 145 150 155 160

Pro Val Ala Ala Val Phe Phe Asn Ala Gln Arg Glu Thr Ala Ser Arg 165 170 175

Arg Arg

<210> 7

<211> 181

<212> PRT

<213> Antirrhinum sp.

<400> 7

Met Ala Ala Lys Val Ser Ser Asp Pro Leu Val Ile Gly Arg Val Ile 1 5 10 15

Gly Asp Val Val Asp His Phe Thr Ser Thr Val Lys Met Ser Val Ile $20 \hspace{1cm} 25 \hspace{1cm} 30$

Tyr Asn Ser Asn Asn Ser Ile Lys His Val Tyr Asn Gly His Glu Leu $35 \hspace{1cm} 40 \hspace{1cm} 45$

Phe Pro Ser Ala Val Thr Ser Thr Pro Arg Val Glu Val His Gly Gly 50 55 60

Asp Met Arg Ser Phe Phe Thr Leu Ile Met Thr Asp Pro Asp Val Pro 65 70 75 80

Gly Pro Ser Asp Pro Tyr Leu Arg Glu His Leu His Trp Ile Val Thr 85 90 95

Asp Ile Pro Gly Thr Thr Asp Ser Ser Phe Gly Lys Glu Val Val Ser 100 105 110

Tyr Glu Met Pro Arg Pro Asn Ile Gly Ile His Arg Phe Val Phe Leu 115 120 125

Leu Phe Lys Gln Lys Lys Arg Gly Gln Ala Met Leu Ser Pro Pro Val 130 135 140

Val Cys Arg Asp Gly Phe Asn Thr Arg Lys Phe Thr Gln Glu Asn Glu 145 150 155 160

Leu Gly Leu Pro Val Ala Ala Val Phe Phe Asn Cys Gln Arg Glu Thr 165 170 175

Ala Ala Arg Arg Arg 180

<210> 8

<211> 175

<212> PRT

<213> Nicotiana tabacum

<400> 8

Met Gly Ser Lys Met Ser Asp Pro Leu Val Ile Gly Arg Val Ile Gly $1 \hspace{1cm} 5 \hspace{1cm} 10 \hspace{1cm} 15$

Glu Val Val Asp Tyr Phe Thr Pro Ser Val Lys Met Ser Val Thr Tyr 20 25 30

Asn Ser Ser Lys His Val Tyr Asn Gly His Glu Leu Phe Pro Ser Ser 35 40 45

Val Thr Ser Lys Pro Arg Val Glu Val His Gly Gly Asp Leu Arg Ser 50 55 60

Phe Phe Thr Met Ile Met Ile Asp Pro Asp Val Pro Gly Pro Ser Asp 65 70 75 80

Pro Tyr Leu Arg Glu His Leu His Trp Ile Val Thr Asp Ile Pro Gly 85 90 95

Thr Thr Asp Cys Ser Phe Gly Lys Glu Ile Val Gly Tyr Glu Met Pro 100 105 110

Arg Pro Asn Ile Gly Ile His Arg Phe Val Phe Leu Leu Phe Lys Gln
115 120 125

Lys Lys Arg Gln Thr Val Leu Thr Ala Pro Leu Ser Arg Asp Arg Phe 130 135 140

Asn Thr Arg Lys Phe Ala Glu Glu Asn Glu Leu Gly Ser Pro Val Ala 145 150 155 160

Ala Val Phe Phe Asn Cys Gln Arg Glu Thr Ala Ala Arg Arg Arg 165 170 175

<210> 9

<211> 175

<212> PRT

<213> Nicotiana tabacum

<400> 9

Met Gly Ser Lys Met Ser Asp Pro Leu Val Ile Gly Arg Val Ile Gly 1 10 15

Glu Val Val Asp Tyr Phe Thr Pro Ser Val Lys Met Ser Val Thr Tyr 20 25 30

Asn Ser Ser Lys His Val Tyr Asn Gly His Glu Leu Phe Pro Ser Ser 35 40 45

Val Thr Ser Lys Pro Arg Val Glu Val His Gly Gly Asp Leu Arg Ser 50 55 60

Phe Phe Thr Leu Ile Met Ile Asp Pro Asp Val Pro Gly Pro Ser Asp 65 70 75 80

Pro Tyr Leu Arg Glu His Leu His Trp Ile Val Thr Asp Ile Pro Gly 85 90 95

Thr Thr Asp Cys Ser Phe Gly Arg Glu Ile Val Gly Tyr Glu Met Pro 100 105 110

Arg Pro Asn Ile Gly Ile His Arg Phe Val Phe Leu Leu Phe Lys Gln

115----125-

Lys Lys Arg Gln Thr Leu Leu Ser Ala Pro Leu Ser Arg Asp Arg Phe 130 135 140

Asn Thr Arg Lys Phe Ser Glu Glu Asn Glu Leu Gly Ser Pro Val Ala 145 150 155 160

Ala Ala Phe Phe Asn Cys Gln Arg Glu Thr Ala Ala Arg Arg Arg 165 170 175

<210> 10

<211> 175

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Glu Val Val Asp Tyr Phe Cys Pro Ser Val Lys Met Ser Val Val Tyr 20 25 30

Asn Asn Asn Lys His Val Tyr Asn Gly His Glu Phe Phe Pro Ser Ser 35 40 45

Val Thr Ser Lys Pro Arg Val Glu Val His Gly Gly Asp Leu Arg Ser 50 55 60

Phe Phe Thr Leu Ile Met Ile Asp Pro Asp Val Pro Gly Pro Ser Asp 65 70 75 80

Pro Tyr Leu Arg Glu His Leu His Trp Ile Val Thr Asp Ile Pro Gly 85 90 95

Thr Thr Asp Cys Ser Phe Gly Arg Glu Val Val Gly Tyr Glu Met Pro 100 105 110

Arg Pro Asn Ile Gly Ile His Arg Phe Val Phe Leu Leu Phe Lys Gln
115 120 125

Lys Lys Arg Gln Thr Ile Ser Ser Ala Pro Val Ser Arg Asp Gln Phe 130 135 140 Ser Ser Arg Lys Phe Ser Glu Glu Asn Glu Leu Gly Ser Pro Val Ala 145 150 155 160

Ala Val Phe Phe Asn Cys Gln Arg Glu Thr Ala Ala Arg Arg Arg 165 170 175

<210> 11

<211> 174

<212> PRT

<213> Nicotiana tabacum

<400> 11

Met Ala Ser Arg Val Val Glu Pro Leu Val Val Ala Arg Val Ile Gly
5 10 15

Glu Val Val Asp Ser Phe Asn Pro Ser Val Lys Leu Asn Val Ile Tyr 20 25 30

Asn Gly Ser Lys Gln Val Phe Asn Gly His Glu Leu Met Pro Ala Val 35 40 45

Ile Ala Ala Lys Pro Arg Val Glu Ile Gly Gly Glu Asp Met Arg Ser 50 55 60

Ala Tyr Thr Leu Ile Met Thr Asp Pro Asp Val Pro Gly Pro Ser Asp 65 70 75 80

Pro Tyr Leu Arg Glu His Leu His Trp Ile Val Thr Asp Ile Pro Gly 85 90 95

Ser Thr Asp Ser Ser Phe Gly Arg Glu Ile Val Ser Tyr Glu Ser Pro 100 105 110

Lys Pro Val Ile Gly Ile His Arg Tyr Val Leu Leu Leu Tyr Lys Gln 115 120 125

Ser Gly Arg Gln Thr Val Lys Pro Ala Ala Thr Arg Asp His Phe Asn 130 135 140

Thr Arg Arg Tyr Thr Ala Glu Asn Gly Leu Gly Ser Pro Val Ala Ala 145 150 155 160 Val Tyr Phe Asn Ala Gln Arg Glu Thr Ala Ala Arg Arg Arg 165 170

<210> 12

<211> 173

<212> PRT

<213> Oryza sativa

<400> 12

Met Ser Arg Ser Val Glu Pro Leu Val Val Gly Arg Val Ile Gly Glu 1 5 10 15

Val Leu Asp Thr Phe Asn Pro Cys Met Lys Met Ile Val Thr Tyr Asn 20 25 30

Ser Asn Lys Leu Val Phe Asn Gly His Glu Leu Tyr Pro Ser Ala Val 35 40 45

Val Ser Lys Pro Arg Val Glu Val Gln Gly Gly Asp Leu Arg Ser Phe 50 55 60

Phe Thr Leu Val Met Thr Asp Pro Asp Val Pro Gly Pro Ser Asp Pro 65 70 75 80

Tyr Leu Arg Glu His Leu His Trp Ile Val Thr Asp Ile Pro Gly Thr 85 90 95

Thr Asp Ala Ser Phe Gly Arg Glu Val Ile Ser Tyr Glu Ser Pro Lys 100 105 110

Pro Asn Ile Gly Ile His Arg Phe Ile Phe Val Leu Phe Lys Gln Lys 115 120 125

Arg Arg Gln Thr Val Ile Val Pro Ser Phe Arg Asp His Phe Asn Thr 130 135 140

Arg Arg Phe Ala Glu Glu Asn Asp Leu Gly Leu Pro Val Ala Ala Val 145 150 155 160

Tyr Phe Asn Ala Gln Arg Glu Thr Ala Ala Arg Arg Arg 165 170

<210>-13

<211> 173

<212> PRT

<213> Oryza sativa

<400> 13

Met Ser Arg Ser Val Glu Pro Leu Val Val Gly Arg Val Ile Gly Glu
1 5 10 15

Val Ile Asp Ser Phe Asn Pro Cys Thr Lys Met Ile Val Thr Tyr Asn 20 25 30

Ser Asn Lys Leu Val Phe Asn Gly His Glu Phe Tyr Pro Ser Ala Val 35 40 45

Val Ser Lys Pro Arg Val Glu Val Gln Gly Gly Asp Met Arg Ser Phe 50 55 60

Phe Thr Leu Val Met Thr Asp Pro Asp Val Pro Gly Pro Ser Asp Pro 65 70 75 80

Tyr Leu Arg Glu His Leu His Trp Ile Val Thr Asp Ile Pro Gly Thr 85 90 95

Thr Asp Ala Ser Phe Gly Arg Glu Ile Ile Ser Tyr Glu Ser Pro Lys 100 105 110

Pro Ser Ile Gly Ile His Arg Phe Val Phe Val Leu Phe Lys Gln Lys
115 120 125

Arg Arg Gln Ala Val Val Pro Ser Ser Arg Asp His Phe Asn Thr 130 135 140

Arg Gln Phe Ala Glu Glu Asn Glu Leu Gly Leu Pro Val Ala Ala Val 145 150 155 160

Tyr Phe Asn Ala Gln Arg Glu Thr Ala Ala Arg Arg Arg 165 170 \cdot

<210> 14

<211> 175

-<212>--PRT-

<213> Arabidopsis sp.

<400> 14

Met Ser Ile Asn Ile Arg Asp Pro Leu Ile Val Ser Arg Val Val Gly 1 5 10 15

Asp Val Leu Asp Pro Phe Asn Arg Ser Ile Thr Leu Lys Val Thr Tyr 20 25 30

Gly Gln Arg Glu Val Thr Asn Gly Leu Asp Leu Arg Pro Ser Gln Val 35 40 45

Gln Asn Lys Pro Arg Val Glu Ile Gly Gly Glu Asp Leu Arg Asn Phe 50 55 60

Tyr Thr Leu Val Met Val Asp Pro Asp Val Pro Ser Pro Ser Asn Pro 65 70 75 80

His Leu Arg Glu Tyr Leu His Trp Leu Val Thr Asp Ile Pro Ala Thr 85 90 95

Thr Gly Thr Thr Phe Gly Asn Glu Ile Val Cys Tyr Glu Asn Pro Ser 100 105 110

Pro Thr Ala Gly Ile His Arg Val Val Phe Ile Leu Phe Arg Gln Leu 115 120 125

Gly Arg Gln Thr Val Tyr Ala Pro Gly Trp Arg Gln Asn Phe Asn Thr 130 135 140

Arg Glu Phe Ala Glu Ile Tyr Asn Leu Gly Leu Pro Val Ala Ala Val 145 150 155 160

Phe Tyr Asn Cys Gln Arg Glu Ser Gly Cys Gly Gly Arg Arg Leu 165 170 .175

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